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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/761,694	01/20/2004	Seung-Woo Lee	21C-0091	3350

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EXAMINER
HOLTON, STEVEN E

ART UNIT	PAPER NUMBER
2629	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	Applicant(s)
Office Action Summary	10/761,694	LEE, SEUNG-WOO
	Examiner	Art Unit	
	Steven E. Holton	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>20 January 2004</u>.

2a)☐ This action is **FINAL.**   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-23</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-23</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1.   Claims 4, 5, 7, and 8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Regarding claims 4 and 7, the claims recite frame memories used for storing grayscale data and compensated grayscale data. Further as stated in claim 1, the compensated grayscale data is to be applied to the drivers of the display device. The embodiments of the present invention do not disclose storing compensated grayscale data that is used for driving the display device within the frame memory. Figs. 4 and 6 show the frame memories storing previous uncompensated data (Gn-1) and difference data between compensated and uncompensated data (G'n-1 – Gn-1). Figs. 11 and 13 show frame memories storing previous uncompensated data (Gn-1) and difference data between compensated and uncompensated data (G"n-1 – Gn-1). Compensated data that is applied to the drivers of the display device (G"n) is never stored within the frame memory. Also, claim 8 is rejected as being dependent on claim 7.

Regarding claim 5, the claim recites that the compensated data is stored in the memory having the number of bits being substantially smaller than the number of bits of the grayscale data. However, the compensated grayscale data is also being applied to the column drivers of the display for driving the display device (claim 1). The specification appears to have compensated grayscale data with the same number of bits as original grayscale data (G'n) and compensated grayscale data with different number of bits as original grayscale data (G'n-Gn) (paragraphs 45-46). The compensated grayscale data (G'n and G"n) would have the same number of bits as original grayscale data, whereas the difference values have smaller number of bits for storing data. The invention described in claim 5 only possess compensated grayscale data to be applied to the display (similar to G'n or G"n) and therefore, the specification does not store the compensated grayscale information using a smaller number of bits than the original grayscale data. Without further description and explanation of which type of compensated grayscale data it is unclear which grayscale data is being stored (difference values or image compensated values), and the specification clearly shows that some compensated grayscale data (image compensated values) are not stored with a smaller number of bits.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2.   Claims 2, 3, 9, 10, 12, 13, and 14-23 are rejected under 35 U.S.C. 112, second

paragraph, as being indefinite for failing to particularly point out and distinctly claim the

subject matter which applicant regards as the invention.

Regarding claim 2, the terms of "grayscale data previously stored in the memory"

and "compensated grayscale data previously stored in the memory" and indefinite and

not distinct. There is no discussion in claims 1 or 2 about when data is stored within

memory or removed from the memory or what type of previous information has been

stored within the memory. Further distinction of what previously stored gray scale data

is being used is needed to more particularly describe the invention. The grayscale data

previously stored in the memory is from the previous frame and is compared to the

current frame. The compensated grayscale data is unclear if it is associated with the

first, second or third compensated grayscale data previously stored. In the case of

claim 2, the second compensated grayscale data generated using previous frame

information is stored and then recalled for creating the third compensated data of the

current frame.

Regarding claim 3, the claim has terms similar to those in claim 2, regarding

"grayscale data previously stored in the memory" referring to grayscale data of the

previous frame and "compensated grayscale data previously stored in the memory"

referring to the third compensated grayscale data generated for the previous frame.

Regarding claim 14, the claim recites, "previously stored grayscale data for a previous frame" and "previously stored compensated grayscale data". Similar to claims 2 and 3, it is unclear what type of compensated grayscale data is being referenced by this term. The Examiner does note that the claim does include storing current frame data and second compensated grayscale data, but it is unclear if the previously stored data is data stored from the immediately previously frame or from some other previous frame data. As recited the invention could call data from a combination of previous image frames or a single one, but it is unclear which previously stored data is used when performing the method.

Regarding claim 19, similar to claim 14, the claim recites "previously stored grayscale data for a previous frame" and "previously stored compensated grayscale data". Also the claim recites "storing the grayscale data". Again the previously stored data is unclearly designated to know which previously stored data is used when operating the method. Further, the grayscale data stored could refer to the grayscale data for the current frame or data for a previous frame.

Claims 9, 10, 12, 13, 15-18, and 20-23 are each dependent upon one of the previously named claims and therefore inherit the problems of their parent claim and are therefore rejected.

The Examiner recommends using more unique and descriptive names for the data recited within the claims. Some terms might be "current frame data", "previous frame data" "current compensated frame data" "difference data" or whatever terms the

applicant chooses. More descriptive terms may help better define and distinguish the

various data used within the claims apparatus and methods.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

3.   Claim 1 is rejected under 35 U.S.C. 102(a) as being anticipated by Lee (USPN:

6825824).

Regarding claim 1, Lee discloses a liquid crystal display device with a timing

controller that generates compensated grayscale data (Fig. 9, element 400). The

display further uses a memory to store grayscale data (Fig. 9, element 420), and applies

the compensated data to a column driver (Fig. 8, element 300). The display further

possesses a gate driver, gate lines, data lines, and switching elements at each pixel

(Fig. 8, elements 200, S1-Sn, O1-Om, and 110).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 6 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Lee.

Regarding claim 6, Lee discloses all of the limitations except the frame memory

being SDRAM or DDR memory. The choice of using SDRAM or DDR memory or any

other type of well known computer memory would be a matter of design choice for one

skilled in the art depending on the application and requirements of the memory device.

It would have been obvious to one skilled in the art that the frame memory of Lee could

be utilized using SDRAM, DDR memory or any other reasonable type of computer

memory.

Regarding claim 11, Lee discloses all of the limitations except for the type of

liquid crystal display device used for the display. The choice of using a Patterned

Vertical Alignment or other type of liquid crystal device would be a matter of design

choice for one skilled in the art. Patterned Vertical Alignment (PVA) and lateral field

induced vertical alignment (LFIVA) are well-known alignment methods for liquid crystal

devices, and it would be a matter of design choice for one skilled in the art to use one or

the other type of alignment for a display device using a compensation system described

by Lee.

Allowable Subject Matter

5.   Claims 14-23 would be allowable if rewritten or amended to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action.

Claims 2, 3, 10, 11, 12, and 13 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

The present invention is directed to a grayscale voltage compensation device and method for driving a liquid crystal display device. Independent claim 14 and related claim 2 identify the uniquely distinct features "<u>generating second compsensated grayscale data in response to the first compensated grayscale data and the grayscale data for the current frame</u>" and "<u>generating third compensated grayscale data in response to the first compensated grayscale data and previously stored compensated grayscale data</u>". The Examiner notes that the "previously stored compensated grayscale data" is referring to a difference value of the difference between previous frame compensated data (G'n-1) and previous frame uncompensated data (Gn-1). The closest prior art, Lee; Lee et al. (USPgPub: 2003/0193460, and Kondo et al. (USPN: 7071930) disclose grayscale compensation methods of driving a liquid crystal display using previous and current data, either singularly or in combination, fail to anticipate or render the above underlined limitations obvious.

Independent claim 19 and related claim 3 identify the uniquely distinct features

"generating second compensated grayscale data in response to the first compensated

grayscale data and previously stored compensated grayscale data" and "generating

third compensated grayscale data in response to the second compensated grayscale

data for the current frame and the grayscale data for the current frame". The Examiner

notes that the "previously stored compensated grayscale data" is referring to a

difference value of the difference between previous frame compensated data (G"n-1)

and previous frame uncompensated data (Gn-1). The closest prior art, Lee; Lee et al.

(USPgPub: 2003/0193460, and Kondo et al. (USPN: 7071930) disclose grayscale

compensation methods of driving a liquid crystal display using previous and current

data, either singularly or in combination, fail to anticipate or render the above underlined
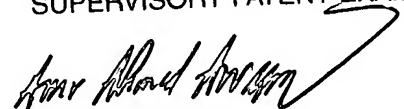
limitations obvious.

6.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Steven E. Holton whose telephone number is (571) 272-

7903. The examiner can normally be reached on M-F 8:30-5.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Amr Awad can be reached on (571) 272-7764. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven E. Holton
Division 2629
February 15, 2007

AMR A. AWAD
SUPERVISORY PATENT EXAMINER